2011

Evidence-based Public Health Practices for Screening for Postpartum Depression

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The following manuscript is submitted for partial fulfillment of the requirements of a Master of Public Health Degree at Wright State University

Acknowledgements

I would like to thank all the people who helped me in this project, my supervisor Dr. Bill Spears, Dr. Cristina Redko and Dr. Sara Paton for being my CE readers. Last but not least I would like to thank all the faculty members in Wright State University's Public Health Program for helping me completing this master's degree.

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Abstract

Background: Five to 20 percent of the women worldwide suffer from Post Partum depression (PPD) which has serious negative impacts on the mother and her newborn. Although PPD is a preventive disease thorough screening using different tools, half of its cases are left undetected.

Purpose of the study: Is to find the best practice for PPD screening, which includes the best screening tool, best setting for screening, best administration period and the best cut-off score.

Methods: It is an Evidence-based Public Health (EBPH) review through a comparative study of 82 studies since 2005 that screened women for PPD in the postnatal period. All the articles were extracted from Pub Med, and each one used a definite screening tool for PPD.

Results: Fifteen research articles reported on 82 studies that met study inclusion criteria. Six different screening tools were used in these studies. The most commonly used screening tool was EDPS (46 of 82 studies). Postpartum Depression Screening was conducted most often in in perinatal clinics (44 studies). Screening was most often administered around six weeks after delivery (57 of 82 studies). No consistent preferred cut-off score for positive PPD findings could be identified for the SPDS because the sensitivity and specificity was not consistent across the studies.

Conclusion: The best practice for PPD screening is to use EPDS as screening tool for PPD around six weeks postnatal at a postnatal or prenatal maternity clinic.

Introduction

With all the excitement that accompanies the impending arrival of a new baby and with all the expected happiness the mother will have, there is unfortunately, an increase risk of depression among new mothers. It is possible that the new mother may be affected by Post Partum Depression (PPD). PPD affects 5%-20% of the women worldwide during the postpartum period (Miller, 2002).

PPD is a major depression that occurs within the first 4 weeks after delivery and lasts for at least two consecutive weeks. The strongest predictor factor for PPD is antenatal depression (Leigh & Milgrom, 2008). Other risk factors are a previous depressive illness, life stress, lack of social support, psychological factors, marital dissatisfaction, obstetric factors, and low socioeconomic status (Robertson, Grace, Wallington, & Stewart, 2004).

PPD is different than normal depression because of the potential impact on the infant, the family as well as the mother. Untreated maternal depression is associated with disruptions in the infant's cognitive (poor infant mental and motor development), emotional, and behavioral development. The infant may develop eating and sleeping problems, separation difficulties and temper tantrums (Csatordai et al., 2007).

Early detection of PPD can't be achieved in a routine antenatal exam. A special assessment that can detect high risk women is required. Primary prevention of PPD by early detection of high risk women and treatment is effective in reducing the undesirable outcomes that impact infants and result in restoring the mother to a healthy condition (Oppo et al., 2009).

Purpose Statement

The purpose of this study is to find the optimal evidence-based public health practices for postpartum depression screening.

Literature Review

Postpartum Depression

The postpartum period is important for the new mother, her newborn and her family. Everyone expects this to be a time of joy and happiness for the family. With the new arrival it is usually so, but it is also a time when the mother faces new challenges of being a mother. She tries to meet the needs of her newborn, to adapt to the changes in her sleep pattern (most often the lack of sleep), and to physically recover from the delivery. All these factors put the new mother at risk for psychological distress during the postpartum period. Glavin, Smith, Sørum, and Ellefsen (2010) mentioned three types of postpartum physiological problems: postpartum blues, postpartum depression, and postpartum psychosis. Postpartum blues is the less severe problem and affects 50 to 80% of mothers. It starts one to five days after delivery and is manifested by fatigue, crying and emotional sensitivity. The most severe problem is postpartum psychosis which affects 0.1% to 0.2% of new mothers during the first week following delivery. These women usually have delusional thoughts, hallucinations and severe emotional distress (Engqvist, Ahlin, Ferszt, & Nilsson, 2010). Between postpartum blues and postpartum psychosis there is postpartum depression (PPD). The prevalence rate of PPD is 7% to15%. The causes and risk factors for PPD are the same as for the depression outside the postpartum period. Risk factors include history of depression, stress, lack of social support and low socioeconomic status. PPD affects the health of the mother and her newborn, as well as her relationship within the family (Goodman, 2004). Usually the woman suffers from insomnia, fatigue, and low self-esteem. The mother may suffer an inability to take care of her new baby either emotionally or physically which affects the infant's attachment to his mother and may lead to cognitive and emotional problems during childhood. The high prevalence of PPD plus its wide range of effects makes PPD as a public health issue, but the good news about this disease is that it can be identified by screenings for the condition and treated before it reaches advanced stages. There

are many instruments and questionnaires that have been proven to be good screening tools. The Edinburgh Postnatal Depression Scale is the most widely used depression screening instrument (Hewitt et al., 2010).

Postpartum depression definition and symptoms

Depending on the definition used the prevalence of PPD ranges between 0.5 – 60.8 percent worldwide. PPD as defined by DSM-IV is a major depressive disorder that starts within the first four weeks after delivery (DSM IVTR; APA, 2000), while it is defined by ICD-10 (International Statistical Classification of Diseases and Related Health Problems) (WHO, 2007) as a mild mental and behavioral disorder that begins within 6 weeks of delivery.

The clinical manifestations of PPD include depressed mood, insomnia or hyper insomnia, feelings of worthlessness , loss of energy, markedly diminished pleasure in almost all activities, significant change in weight (weight loss or gain), psychomotor agitation or retardation, excessive guilt, reduced self-esteem and self-confidence, difficulty in concentration, and suicidal ideation (APA, 2000; WHO, 2007). The severity of depression after giving birth varies among women; it can be anything from postnatal blues (short and frequent symptoms of depression) (Edhborg, 2008), to severe psychosis with suicidal thoughts (Noble, 2005; Paulson, Dauber, & Leiferman, 2006).

Etiology of postpartum depression

Women are twice more likely to have major depressive disorder than men (Kessler, Chiu, Demler, Merikangas, & Walters, 2005) and men usually do not suffer from PPD (Munk-Olsen, Laursen, Pedersen, Mors, & Mortensen, 2006) suggest that genetic factors and the female physiology system may be related to PPD. It is well documented that there are hormonal changes after delivery due to the rapid fall in estrogen and progesterone level and that these changes can lead to depressive mood (Paulson et al., 2006). While (Gleicher, 2007) pointed out to the possibility that PPD is an autoimmune disease depending on the new theory which says that

autoimmune disease is a result of the passage of fetal-maternal microorganisms (Gleicher, 2007) in the two directions. But Ross, Murray, and Steiner (2005) found that sleep disturbance and the change in the quality and quantity of the sleep after giving birth may be a cause of PPD not a consequence of it, his theory was first introduced by (Karacan, Williams, Hursch, McCauley, & Heine, 1969) and after that was supported with many studies (Frank, Kupfer, Jacob, Blumenthal, & Jarrett, 1987; Coble et al., 1994; Lee, McEnany, & Zaffke, 2000).

Impact of postpartum depression

PPD is unique in the fact that it can affect the mother, her baby and as well as the whole family. Having a new baby should be a pleasant time for the mother and her family; this is not always the case. The mother may suffer from depression which could affect her connection with the new baby and could decrease her ability of taking care of the baby. This has the potential to result in feelings of guilt and hopelessness. Having PPD can increase the mother's susceptibility to smoke and to abuse alcohol and drugs. The risk for physical, emotional and sexual abuse is also elevated because the women are more vulnerable to different types of abuse during this period. Fairbrother and Woody (2008) found also that women with PPD may be more likely to have intense thoughts of either accidentally or intentionally hurting the baby. PPD may have long-term influences on the mother-infant relationship and on child development; this effect is gender- specific as male infants are more affected by maternal depression than female infants. When the interaction between the mother and her infants is affected by PPD the result can be lower cognitive functioning and emotional problems (Tronick & Reck, 2009).

Untreated maternal depression affects the mother's ability to take care of her new baby. She is less likely to respond to the baby's cues. The mother's parental behaviors are affected by depression with things such as feeding the baby, sleep-patterns, breast feeding and paying attention to safety habits. The mother's depression, if left untreated, may result in her children

suffering from psychiatric problems such as anxiety and affective disorders during their childhood (Csatordai et al., 2007).

Risk factors for postpartum depression

Risk factors for PPD fall into different categories: strong, strong-moderate, moderate, and mild. Experiences of depression or anxiety during pregnancy or a previous depressive illness are the strongest risk factors (Robertson et al., 2004). Early detection and treatment of depression during pregnancy is very critical, as untreated cases can develop to postpartum depression with its negative outcomes on the mother and her baby (Ryan, Milis, & Misri, 2005).

Johanson, Chapman, Murray, Johnson, and Cox (2000) reported that one third of PPD cases progress though a continuum of depression during pregnancy. Josefsson, Berg, Nordin, and Sydsjo (2001) followed 417 women during pregnancy until 6 weeks after birth that the rate of depression decreased from 17% during late pregnancy to 13% at week 4-6 after delivery.

Life stress and lack of social support have a moderate to severe influence on PPD (Robertson et al., 2004). Robertson, Grace, Wallington, and Stewart (2004) said that women who experience two or more stressful life events the year before pregnancy are more likely predisposed to PPD. Stressor events are life experience such as death of a family member, loss of one's job, moving, and a chronic disease diagnosis. Social support is usually having people available who can offer help to the mother taking care of her new baby and who can support her emotionally during the pregnancy and at postpartum period (Pope, Watts, Evans, McDonald, & Henderson, 2000); while lack of social support has negative impact on the mother and increases her risk for PPD (Honey, Morgan, & Bennett, 2003).

Psychological factors have a moderate effect (Robertson et al., 2004). Mothers with low self esteem (Ritter, Hobfoll, Lavin, Cameron, & Hulsizer, 2000), those who are perfectionist and those who have high interpersonal sensitivity are more likely to develop PPD (Boyce, Parker, Barnett, Cooney, & Smith, 1991). Obstetric factors and socioeconomic status have a small effect

on PPD (Robertson et al., 2004). A history of miscarriages or terminations of pregnancies can increase the mother's risk for PPD (Pope et al., 2000; Robertson et al., 2004). Low socioeconomic status and low educational attainment also have small impacts on PPD (Patel, Rodrigues, & DeSouza, 2002; Tammentie, Tarkka, Astedt-Kurki, & Paavilainen, 2002).

Depression during pregnancy and family history of depression: Depression during pregnancy results in negative consequences for both the baby and the mother. Depression during pregnancy is associated with a three to fourfold increase in PPD within six month after delivery (Oppo et al., 2009). It can lead to preterm birth, increasing in smoking behavior, deteriorating of social function and emotional withdrawal which are themselves predisposing factors for PPD (Bowen & Muhajarine, 2006). Robertson and colleagues (2004) found that depression during pregnancy is a strong predictor of postpartum depression. This supports the hypothesis that postpartum depression is a continuation of major depression that occurred during pregnancy. Kumar and Robson (1984) reported that other studies found that major depressive symptoms can occur prenatal and not reoccur in the postnatal period or can start in the postpartum period without having experienced depression during pregnancy. These studies suggest that antenatal and postpartum depressions are distinct disorders. While it is well confirmed that major depression disorder is familial, it cannot be confirmed that genetic factors predispose women to PPD (Murphy-Eberenz et al., 2006).

Postpartum depression and anxiety: Anxiety is considered a normal consequence of the physiological and psychological changes during pregnancy especially if the anxiety is related toward the health of the baby and the concerns about being a mother, such as the new tasks associated with taking care of the baby and at the same time maintaining the perfect image as a mother of other children if she has other children. These concerns may also extend to her role as a wife. A history of anxiety during the first trimester is not a predictor for PPD. However, in some cases anxiety can be related to panic disorder which is a strong predictor of PPD. A history

of panic disorder during the first trimester of pregnancy increases the chance of PPD by 4.2 times. If the mother has a family history of panic disorder the risk for PPD is 2.1 times as high. Rambelli and colleagues (2010) said that panic disorder should be identified and treated as a measure to prevent the development of PPD. Anxiety during pregnancy is twice as common as depression, but depression in the postpartum period is twice as common as anxiety (Heron, O'Connor, Evans, Golding, & Glover, 2004). While studies found that a history of anxiety during the first trimester is not a predictive factor for PPD, Sutter-Dallay, Giaconne-Marcesche, Glatigny-Dallay, and Verdoux (2004) found at their MATQUID cohort study that women with a history of anxiety disorder during third trimester are three times more likely to experience PPD.

Postpartum depression and smoking: Both smoking and PPD are maternal and treatable conditions that have adverse effects on the mother and her newborn. Smoking is associated with increasing the infant's risk for sudden infant death, low birth weight, attention-deficit/hyperactivity disorder, asthma, and otitis media (National Cancer Institute, 1999, Milberger, Biederman, Faraone, Chen, & Jones, 1996). Many researches had been found that smoking is associated with increased incidence of postpartum depression (Bryan, Georgiopoulos, & Harms, 1999). A study that surveyed 4,353 women 15 months after delivery found that the prevalence of a major depressive episode is higher among smokers (17.7%) than nonsmokers (12.1%), smoking was also more common among mothers who have experienced a major depressive episode than in those without one: 34.0% vs. 25.5%, so when these two conditions co-occur they have to be treated at the same time (Whitaker, Orzol, & Kahn, 2007). Research studies had found that smoking can cause preterm delivery and low- birth weight infants which in turn can increase the risk of PPD support, lack of education, low income and smoking which are also risk factors for PPD (Gungor, Oskay, & Beji, 2011).

Postpartum depression and social support: Social support is defined as the interpersonal resources that are accessed and mobilized when individuals attempt to deal with the everyday

stresses and strains of life (Chen, Tseng, Wang, & Lee, 1994). The research studies found that Lack of social support is associated with increased risk of PPD. Several studies pointed out that social support can reduce bad behaviors among women at the postpartum period as smoking and drug abuse (Brugha et al., 1998; Collins, Dunkel-Schetter, Lobel, & Scrimshaw, 1993). Support is usually provided by the husband or partner through emotional support, a family member by taking care of the baby or hospital personnel by giving advice-regarding nursing the baby and taking care of his hygiene.

Cultural activities during pregnancy vary between populations. Cultural practices could help in decreasing the chance of PPD or they could increase it. Many cultures have different ideas about how to deal with the confinement period following the birth. Some societies consider this time as an individual and private time and they leave the new mother alone to deal with the new baby as is the custom in western culture. In eastern culture there is a wide interference with the new mother and her newborn daily life; usually mother or mother-in-law determines the food the mother will eat, the time of the mother's bath, and the way she and her baby dress (Wan et al., 2008).

In eastern culture the families of the new parents play an important role during the confinement period which is usually lasts up to 40 days after delivery. The new mother usually is able to rest physically during this time. There is someone who is taking care of the mother's needs, the baby's needs, and the housework. It is also a time when a lot of people come to congratulate the new mother, but at the same time the trade-off is that they interfere with every single detail in her behavior regarding taking care of herself and her baby. How the mother tolerates the ritual confinement period may improve interpersonal relationships and enhance the health of the women, or it may be perceived as violations of privacy and the mother's time with the baby (Klainin & Gordon, 2009).

In some cultures, as in Turkey, giving birth is a protective factor against depression because the level of social support the mother usually receives at this period which include the physical and emotional respect; women in Turkey usually stay resting after birth while many of her family members take care of the home chores and the newborn needs, they also throw parties to appreciate her and to welcome the baby (Kara, Unalan, Cifcili, Cebeci, & Sarper, 2009). In China the social support the new mother gets during the first month after delivery, which is usually called Zuoyuezi, could double the risk of PPD if it is provided by the mother in law. The mother-in-law has a lot of power over her daughter-in-law. Often she uses this power to control the life of her daughter-in-law in the postpartum period and to impose more pressure on the new mother. This pressure can increase the chances the mother will experience depression (Wan et al., 2009).

Postpartum depression and violence: Violence during pregnancy affects the physical and mental health of the mother and it also affects the health of the baby (Romito, Pomicino, Lucchetta, Scrimin, & Turan, 2009). Cohen, Schei, Ansara, Gallop, and Stewart (2002) found that only emotional abuse plays a role in elevated the risk of PPD, sexual or physical abuse do not increase the risk of PPD. Violence during the postpartum period is more common than during pregnancy. The rate of violence during pregnancy varies worldwide between 6% and 17%. The risk factors for partner violence are almost the same as the risk factors for post-partum depression. These include: financial dissatisfaction, migration status, unwanted pregnancy and being unemployed (Saurel-Cubizolles & Lelong, 2005; Saltzman, Johnson, Colley, & Goodwin, 2003).

Postpartum depression and socioeconomic status: Many studies around the world had been conducted to find the impact of income, educational level and employment status on the occurrence of PPD. The influence of low income increasing the chances of PPD was confirmed in some studies in the USA (Segre, O'Hara, Arndt, & Stuart, 2007), Brazil (Tannous, Gigante,

Fuchs, & Busnello, 2008), and Turkey (Gulseren et al., 2006). In other studies in the USA (Goyal, Gay, & Lee, 2010) and Japan (Miyake, Tanaka, Sasaki, & Hirota, 2011) found that low income does not increase the chance of PPD. There are also different results for the association between employment status and the incidence of PPD; some studies found that full employment job reduces the occurrence of PPD (Mayberry, Horowitz, & Declercq, 2007). Others confirmed that employment status does not have any role in increasing the possibility of PPD (Goyal et al., 2010). While Patel, Rodrigues, and DeSouza (2002) reported that in India full time employment increases the risk for PPD. Although there was no agreement among the research studies regarding the impact of income and employment status on the occurrence of PPD, there was an agreement regarding the effect of educational level; they found that educational level does not increase or decrease the risk of PPD (Goyal et al., 2010; Miyake et al., 2011). But one interesting result comes from the result of the prospective study in Japan (Miyake et al., 2011) which claimed that holding a high prestigious job (which is associated with a high level of education) is a protective factor against PPD.

Postpartum depression and parity: Although research studies found an association between multiparty and depression during the third month of pregnancy (Borri et al., 2008), no difference in the rates of PPD were found between multiparous and primiparous women. Multiparous women had more risk factors for PPD such as lack of social support, previous depression, marital dissatisfaction and low self esteem than primiparous women. But multiparous women receive more psychological and drug treatment for depression (Oppo et al., 2009).

Postpartum depression and lack of sleep: Sleep disturbance is very common during the post-partum period because of the newborn pattern of feeding and sleep. Although there is an association between lack of sleep and PPD, the relationship is not fully documented, because of the ambiguity of the definitions of the terms (Hunter, Rychnovsky, & Yount, 2009).

Postpartum depression and infant health: Delivery before 37 weeks of pregnancy is called preterm birth. It has been proven that pre-term infant is associated with higher risk for PPD. At the same time it is well known that pre-term is associated with low social support, lack of education, low income and smoking which are also risk factors for PPD (Gungor, Oskay, & Beji, 2011).

Treatment for Postpartum Depression

Usually there is a delay for the treatment for PPD because mothers do not like to admit they have psychological symptoms due to the social shame of a possible psychiatric illness. Mothers also do not realize that they are sick but their symptoms instead contribute their feeling of failure as a mother.

Treatment of PPD is similar to the treatment of depression outside the postpartum period, except for additional concerns during this period; concerns of breastfeeding, hormonal changes after delivery and the fear of being separated from their baby if they get a treatment (Oppo et al., 2009).

Pharmacological treatment

Antidepressants

No difference in the mother's response for antidepressant medication was found during postpartum period and outside of this period (Payne, 2007; Pearlstein, Howard, Salisbury, & Zlotnick, 2009). Many open- label studies have been conducted and shown the effectiveness of many types of antidepressants for PPD; venlafaxine (Cohen et al., 2001), sertraline (Stowe & Nemeroff, 1995), bupropion (Nonacs et al., 2005), fluvoxamine (Suri, Burt, Altshuler, Zuckerbrow-Miller, & Fairbanks, 2001) and paroxetine (Misri, Reebye, Corral, & Milis, 2004).

Antidepressants and breast feeding

The importance of breastfeeding for the health of the mother and the baby is well known. As a result the American Academy of Pediatrics recommends that mothers have to breastfeed

their babies. However a big concern is when we will treat a breastfeeding mother with any medication in general and with antidepressants in particular due to scarce data regarding safety. Eberhard-Gran, Eskild, and Opjordsmoen (2006) found a low number of reported adverse effects when using tricycles and SSRIs during breastfeeding. Many considerations have to be taken as a safety procedures while taking antidepressants, for instance, taking the medicine after breastfeeding and before sleeping , using medication that was effective during previous episodes of depression, using the same medication that was used during pregnancy because the infant had been already exposed to that medication; and finally, the family member has to be familiar with the side effects of the medication on the infants such as sleep and agitation (Payne, 2007).

Hormonal treatment

Use of hormone treatment can be effective because the change in the estrogen and progesterone during the postpartum period can be responsible for the maternal mood changes (Moses-Kolko, Berga, Kalro, & Wisner, 2009).

Non-pharmacological

Some mothers find non-pharmacological treatments desirable if they breastfeed their infants. This includes psychological and psychosocial treatments; both these treatments were found to be effective in decreasing post-partum depression (Dennis & Hodnett, 2007).

Psychological treatment includes Interpersonal Therapy (IPT) and Cognitive Behavioral Therapy (CBT) while psychosocial treatments include nondirective counseling and peer and partner support (Fitelson, Kim, Baker, & Leigh, 2011).

Screening for post-partum depression

Screening for PPD is very useful in identifying women at risk for PPD. Women who are identified as high risk should be offered appropriate treatment and prevention strategies to reduce the chance of occurrence of PPD and the negative outcomes that will affect the mother and her baby. There are 13 instruments that are used to assess the increase risk of PPD. Screening

instruments are considered to be a good prevention tool to help identifying women with high risk factor for PPD during their pregnancy or in the postpartum period (Oppo et al., 2009).

These instruments are:

1. Beck Depression Inventory (BDI)
2. Beck Depression Inventory (BDI-II)
3. Bromley Postnatal Depression Scale (BPDS)
4. Center for Epidemiologic Studies Depression Scale (CES-D)
5. Clinical Interview Schedule (CIS)
6. Diagnostic Interview Schedule (DIS)
7. Edinburgh Postnatal Depression Scale (EPDS)
8. General Health Questionnaire (GHQ)
9. Inventory of Depressive Symptomatology (IDS)
10. Postpartum depression Screening Scale (PDSS)
11. Zung Self-Rating Depression Scale (Zung SDS)
12. Pregnancy Health Questionnaire (PHQ)
13. Pregnancy Health Questionnaire-9 (PHQ-9)
14. Two question screen of the PHQ

The most commonly used screening instruments for PPD are:

Edinburgh Postnatal Depression Scale (EPDS)

EDPS is designed to assess post-partum depression. It was first designed for use by women who speak English. It has subsequently reached non-speaking English countries. It is a self-report instrument which has 10 items. Items written in the past tense include statements relating to feelings mothers experienced in the past seven days and evaluate depressed mood, anhedonia, guilt, anxiety and suicidal ideation. The EPDS is usually administered by the paper and pencil method although computerized versions are available; it is brief, taking approximately

5 minutes to complete, and easy to administer, score and interpret. It is a self-report instrument which has 10 items. The range of scores is from 0 to 30. A score above 12 suggests a high possibility the woman is experiencing PPD. EPDS has a high specificity and sensitivity (Adewuya, Eegunranti, & Lawal, 2005). It is necessary to consider that the cut-off score should be set at different levels for different countries (Nishimura & Ohashi, 2010). The EPDS is used to evaluate postpartum depression at birth and at six, 12, 18 and 24 weeks post-partum (Boyce & Hickey, 2005).

Postnatal Depression Screening Scale (PDSS)

The PDSS is a postpartum depression screening tool that can identify women who could suffer from PPD. It is a 35-item Likert-type response scale that can take 5 to 10 minutes to complete; it is brief and easy to understand and interpret. The PDSS consists of seven dimensions (each of them contains five items). The dimensions include sleeping and eating disturbances, anxiety/insecurity, emotional liability, cognitive impairment, loss of self, guilt/shame, and thoughts of self-harm. Each item describes the type of feelings a woman may experience after the birth of a child. Mothers are asked to indicate their feelings on a 5-point scale ranging from ‘strongly agree’ to ‘strongly disagree’ regarding how they have felt in the last 2 weeks. Scores of 80 or above indicate major depressive disorder while 60 or above indicate minor depression disorder. It has a sensitivity of 91% to 94%, specificity of 72% to 98% and a positive predictive value of 33% to 88%.

Beck Depressive Inventory (BDI)

The BDI instrument contains 21 items related to particular symptoms of depression in the last week. Even though this is a general depression scale it has been used frequently with pregnant and postpartum women (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Each item is scored from zero to three in terms of intensity where (0) I do not feel sad, (1) I feel sad, (2) I am sad all the time and I can't snap out of it, (3) I am so sad or unhappy that I can't stand it. The

total score of the 21 items is interpreted as follows: 0 to 9 indicates minimal depression, 10 to 18 indicate mild depression, 19 to 29 indicate moderate depression, 30 to 63 indicate severe depression, and higher scores indicate more severe depression (Beck et al., 1961).

Beck Depressive Inventory-II (BDI-II)

In response to the change of many of the diagnostic criteria for Major Depressive Disorder by the American Psychiatric Association's publication of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, A new version of BDI was created in 1996, this version is BDI-II. In this revision some items were replaced (changes in body image, hypochondria, and difficulty working), some were revised (sleep loss and appetite loss items), and some remained the same (items dealing with feelings of being punished, thoughts about suicide, and interest in sex). Also as opposed to ask about the feelings in the past week as in the original BDI, participants were asked to rate how they have been feeling for the past two weeks.

BDI and BDI-II both contain 21 questions, each answer scores on a scale value of 0 to 3. The cut-off scores used in BDI-II differ from the original BDI: 0 to 13 indicates minimal depression; 14 to 19 indicate mild depression; 20 to 28 indicate moderate depression; 29 to 63: severe depression and higher total scores indicate more severe depressive symptoms.

(General Health Questionnaire) GHQ 12

GHQ (Goldberg, 1972) is a self-administered questionnaire that has 60 items; it is originally used to detect common mental disorder such as anxiety and depression among general medical patients. GHQ-12 is GHQ version that has 12 items of the 60 original items; it evaluates the response for each item using a four-level alternative response scale and the total score ranges from zero to 12. Boyd, Le, and Somberg (2005) recommended the 12-item GHQ to detect postpartum depression because this version is the shortest type of GHQ and has a slightly higher sensitivity and positive predictive value. Among general population, GHQ 12 has76% sensitivity and 80% specificity at the optimal cut-off score of 2/3 (Lobo & Muñoz, 1996; Oppo et al., 2009).

Patient Health Questionnaire 9 (PHQ-9)

The PHQ-9 is a nine-item self-report depression screening tool that evaluates symptoms experienced during the past 2 weeks (Kroenke, Spitzer, & Williams 2001). Each item includes four possible responses that correspond to the duration of the symptoms. There are two scoring methods for PHQ-9: summary scoring algorithm and a diagnostic algorithm. In the summary scoring (simple scoring), scores ≥10 of a scale range 0 to27 are often used to screen for major depression (Kroenke & Spitzer, 2002). The PHQ-9 diagnostic algorithm scoring (complex) is based on DSM-IV depression diagnostic criteria (Spitzer, Kroenke, & Williams, 1999). Patient must have at least five depressive symptoms at least "more than half of the days" and at least one of those must be depressed mood or loss of interest.

Research Questions

This study the best practices for PPD screening. These practices include the best screening tool depending on the most common used tool and the best sensitivity and specificity, the best time and setting for screening, and the best cut-off score. There are 13 screening tools for PPD used in various settings around the world; six of these are most commonly used. This study is designed to identify the screening instrument that is best identifying for depression among women during the postnatal period.

Methods

According to Brownson, Fielding, and Maylahn (2009), one key component of Evidence-based Public Health (EBPH) is to make decisions based on the best available scientific data. This study is an EBPH review in which an analysis of Post Partum Depression (PPD) using published literature is provided. Pub med, WSU library and Ohio LINK were searched for articles using the following search terms: antenatal depression, postnatal depression, postpartum depression, screening, prevention, and best practices. In addition, the references cited in the published articles were searched, and those which appeared relevant were also retrieved.

Criteria for the selection of studies: To be included in this analysis, a study had to meet all of the following criteria:

1. Women were screened for PPD using at least one of the 13 validated screening tools for PPD.
2. Women were screened during the postnatal period (from birth until 18 month after delivery).
3. The diagnostic criteria of PPD for the study were based on the DSM-IV, DSM-III and International Classification of Diseases (ICD-10). The study was published in 2005 or later.
4. The study was written (or translated) in English.

The requirement that studies be published in 2005 or later insured that findings are based on the most current research. The studies in this research were not restricted to a specific location or country; all international studies that met the criteria for inclusion were included. It was not necessary to exclude articles based on sample size; the minimum sample size in the studies was 104. Studies reviewed for this research include all women in the child bearing ages (15 to 44).

All settings in which screenings were conducted were included in this study. Screening can be done at a variety of locations, including primary care physician's office, OB/GYN physicians' office, pediatrician's office, and health departments or even by phone, or in the patient's home. Studies were reviewed to ensure that a rigorous protocol was used to screen mothers and confirm the mothers would be able to understand all the questions in the questionnaire. It was not necessary that the person who administered the screening instrument be physician or a psychiatrist, only that he or she had the ability to ask the questions clearly and to record results correctly.

Types of screening: Each study used at least one PPD screening instrument during the postnatal period to classify women as either at risk or not at risk of postnatal depression, on the basis of reliable diagnostic criteria.

Study measures: The following characteristics of the screening instrument were sought:

1. The title of screening instrument(s) used in each study was recorded.
2. Cut-off score: Most of the instruments used more than one cut-off score to determine which participants are at risk for PPD.
3. Sensitivity and specificity: Sensitivity of the screening instrument is an essential outcome measure examined in this analysis. Sensitivity and specificity rates for each cut-off score for an instrument were recorded for each article.

4 Time of the screening: the time within the postnatal period in which screening was conducted was recorded for each study.

Calculated Measures

Sensitivity of the screening instrument is an essential outcome measure used to analyze the usefulness of screening tools in detecting whether women have PPD. Sensitivity is defined as the ratio between those patients who test positive and all those patients who actually have the disease, whether their tests are positive or false negative. Most studies reported the sensitivity of each screening tool. If the sensitivity was not available it was calculated using this formula: Sensitivity = TP / (TP+FN), where TP is the number of true positives (the patient screened positive for PPD and received a PPD diagnosis). FN is the number of false negatives (the patient screened negative for PPD but received a PPD diagnosis).

Specificity of the screening instrument is another essential outcome measure used to analyze the effectiveness of screening tools. Specificity is defined as the proportion of patients without the disease who test negative. Most of the studies reported the specificity for each screening tool and for each cut-off score used for that tool. If the specificity was not available it

was calculated using this formula: Specificity= TN / (TN + FP), where TN is the number of true negatives (patient screened negative for PPD and did not receive a diagnosis of PPD). FP is the number of false positives (patient screened positive for PPD but did not receive a diagnosis of PPD).

Analytical criteria:

The data abstracted from each paper were tabulated using Microsoft Excel. Results were collected by instrument and cut-off scores used to determine whether a woman was at risk of PPD, the rate of depression in each study was reported. For each cut-off score for each instrument the mean, median, the standard deviation, the range, the Number Needed for Diagnosis NND and the Youden score were calculated for the specificity and sensitivity. In addition, the mean, median and range of the maternal age and the rate of PPD were also calculated.

Number needed to diagnose (NND) is a function of sensitivity and specificity, which are tend to remain highly stable across populations. The NND indicates the number of tests that need to be undertaken in order to get a positive diagnosis, its formula is:

NND=1/ [sensitivity-(1-specificity)]. It gives a comparison between tests. An optimal NND value would be close to 1.0 (Batstone, 1997).

Youden index: It measures the effectiveness of a diagnostic marker and help in the selection of an optimal cutoff point. It is calculated as (sensitivity +specificity-1); it has minimum and maximum values of -1 and +1, with an optimal value +1 (Schisterman, Faraggi, Reiser, & Hu, 2008).

A count was used to identify which screening tool was most commonly used. The sensitivity and specificity for each tool and for each cut-off score used were evaluated based on the mean and standard deviation.

Criteria for determination of evidence-based screening practices:

The best screening tool for PPD: was detected depending on four criteria (chosen by the author of this study):

1. The best setting in which to screen for post-partum depression was determined by reviewing the settings in which the instruments were used in each study. The most commonly used setting across all the studies was identified as the best setting in which to screen for post-partum depression.
2. The best time-period in which to screen for post-partum depression was determined by reviewing the time-periods in which the instruments were used in each study. The most commonly used time-period across all the studies was identified as the best setting in which to screen for post-partum depression.
3. The most commonly used instrument was determined by reviewing the number of times each instruments was used in peer reviewed research articles. The instrument with the largest number of uses in studies is the most commonly used instrument. The most frequently studied instrument was detected by the number of times each instrument was used in the various studies. Several of the research projects used one of the Post-Partum Depression Screening instruments more than once with different cut-off scores to determine which score was the most successful for determining whether a mother was at risk of PPD. The numbers of times each of the instruments were studied across all the articles were summed. The instrument with the largest number was considered most frequently studied instrument.
4. *The* optimal cut-off score *for the most commonly used screening tool:* the sensitivity of the screening tool is very important from a clinical perspective. If the screening tool has a high sensitivity it can identify post-partum women who are depressed

(sensitivity). But at the same time it is important to not falsely identify post-partum women as depressed when they are not (false positives). An increase in false positive results in a decrease in the specificity. The most sensitive cut-off score was identified by comparing the mean and the standard deviation of the sensitivities for the instrument. The goal is to identify the cut-off score with the highest mean sensitivity with the smallest standard deviation paired with the highest mean specificity with the smallest standard deviation. The optimal sensitivity and specificity is likely to not include the highest value for either measure.

Results

A total of 82 studies (published in 16 articles), met the inclusion criteria. Each of the articles had at least one study depending on the number of screening tool and the number of different cut- off point that had been used. A full list of included studies can be found in the Appendix 1.

Postpartum Depression Screening Instruments

1. Most commonly used instruments

Six screening tools were evaluated in this research from the 16 articles reviewed. Some articles used more than one screening tool in their research; these tools were Edinburgh Post-natal Depression (EPDS), Beck Depression Inventory (BDI), Beck Depression Inventory II (BDI-II), Post-natal Depression Screening (PDSS), Pregnancy health Questionnaire (PHQ-9), and General Health Questionnaire (GHQ-12).

Table 1 shows the screen tools and the number of studies in which the instrument was used.

Table 1. Evaluated Screening Tools and Number of Studies

Screening tool	Number of studies
EPDS	**46**
BDI	**14**
PDSS	**8**
GHQ-12	**7**
PHQ-9	**4**
BDI-II	**3**

EPDS was used 11 times across the 16 studies; it was studied 46 times in different studies compared to the next most commonly studied instruments, the PDSS (12 times) and BDI (8 times). The EPDS was the most frequently used and most commonly studied screening tool.

2. Setting

Table 2 shows the setting in which the postpartum depression screening instruments were across the different studies.

Table 2. Setting for PPD Screening

Study and date	Country	Instrument	Number of Uses	PPD Rate
Hospital Maternity Clinic				
Jardi, 2006	France	EPDS	7	16.1%
Agoub, 2005	Morocco	EPDS	4	6.9%
Austin, 2005	Australia	EPDS	1	5.2%
Teng, 2005	Taiwan	BDI-II	3	10.3%
Post-Natal/Perinatal Clinic				
Navaro, 2007	Spain	EPDS	8	25.4%
Pitanupong, 2007	Thailand	EPDS	7	1.0%
Abiodun, 2006	Nigeria	EPDS	7	18.6%
Adewuya, 2005	Nigeria	EPDS	6	14.6%
Hanusa, 2006	USA	EPDS	1	11.0%
Navaro, 2007	Spain	GHQ-12	7	25.4%
Adewuya, 2005	Nigeria	BDI	6	14.6%
Hanusa, 2006	USA	PDSS	1	11.0%
Hanusa, 2006	USA	PHQ-9	1	11.0%
Outpatient – Primary Care				
Gjerdingen, 2009	USA	PHQ-9	2	8.9%
Flynn, 2011	USA	PHQ-9	1	73.0%
Flynn, 2011	USA	EPDS	1	73.0%
Chaudron, 2010	USA	EPDS	1	37.0%
Chaudron, 2010	USA	PDSS	1	37.0%
Chaudron, 2010	USA	BDI	1	37.0%
Community Based Organization				
Vittayanont, 2006	Thailand	PDSS	6	1.0%
Milgrom, 2005	Australia	EDPS	3	8.0%
Milgrom, 2005	Australia	BDI	3	8.0%
Acute care Clinic				
Beck, 2005	USA	BDI	4	18.0%

The setting of PPD screening had been done 44 times in post-natal/perinatal clinics, 15 times in hospital maternity clinics, 12 times in community based organization, seven times in out-patient- primary care and four times in acute care clinics

Studies were undertaken in different countries:, 19 in Nigeria, 15 in Spain, 14 in USA, 13 in Thailand, 7 in France, 7 in Australia, 4 in Morocco and 3 in Taiwan. The diversity of cultures in which studies were conducted may have an impact on the ability to compare results in different circumstances.

The EPDS was used in all of these countries except in Taiwan, where the local version was used. EPDS had been translated to the local spoken language at each country where English is not the spoken language.

3. Administration period

The administration period for PPD screening using EDPS was in a range from birth up to 56 weeks postnatal, 33 of the studies contracted patients in a window of time around six weeks after delivery. Seven studies contacted patients between three to five days postpartum and one study extended their screening period up to 56 weeks postpartum.

The administration periods for other screening tools in our study were almost at the same range of EPDS. Administration periods for the studies that used BDI, BDI-II, PDSS, PHQ, and GHQ-12 were in a range of two weeks and 56 weeks postnatal, where 24 studies contracted around six weeks, four studies had an administration period between two and 12 weeks and two studies had a long administration period from two weeks until 14 months, while three other studies occurred at four month postnatal.

Table 3. Administration Period for PPD Screening

Study, Country, Year	PPD Rate	Time of screening
Austin, 2005, Australia	5.20%	32 weeks gestation, 2-4 month postnatal
Jardi, 2006, France	16.10%	3 to 5 days postnatal
Beck, 2005, USA	18.00%	2 to12 weeks postnatal
Chaudron, 2010, USA	37.00%	2 weeks to 14 months postnatal
Hanusa, 2006, USA	11.00%	6 to 8 weeks after birth
Abiodun, 2006, Nigeria	18.60%	6 weeks postnatal
Agoub, 2005, Morocco	6.90%	6 weeks, 6 and 9 months postnatal
Navarro, 2007, Spain	25.40%	6 weeks postnatal
Pitanupong, 2007,Thailand	1.00%	6 to 8 weeks after birth
Vittayanont, 2006,Thailand	1.00%	6 to 8 weeks after birth
Adewuya, 2005, Nigeria	14.60%	6 weeks postnatal
Teng, 2005, Taiwan	10.30%	6 weeks postnatal
Milgrom, 2005, Australia	8.00%	4 months postnatal
Gjerdingen, 2009, USA	8.90%	N/A

4. Cut-off scores and sensitivities and specificities

The recommended cut-off score for EPDS is 10, at this score women who are at increased risk for PPD can be detected and at the same score there are a reasonable number of false positive cases (Cox, Holden, & Sagovsky, 1987). To determine if a more optimal cut-off score could be identified researchers tested the EPDS instrument using a wide range of cut-off scores in efforts to determine the optimal cut-point to identify women at risk of postpartum depression. In 45 studies in populations across the world cut-off scores between six and 14 were used. In some cases decimal cut-off scores were used, these were rounded to the nearest whole number. Table 4 shows the number of studies conducted using these cut-off scores and the average sensitivity and specificity for studies that used a certain cut-off score. The sensitivity and specificity for EPDS varied depending on the cut-off score considered and the population studied. The table below is showing that the average of the sensitivity among different studies is the highest at the cut-off score 6 (0.91) and it is the lowest at the cut-off score 14 (0.40). The average of sensitivity decreased as the cut-off score increased. The exception was at the cut-off score 13 which had an average sensitivity of 0.71 following a sensitivity of 0.61 for the cut-off score of 12. The average specificity ranged from 0.61 to 1.00. The average of specificity was increasing as the cut-off score was increasing except at the cut- off scores 11 and 13. The Youden Index combines the sensitivity and the specificity scores to create a range from 0.00 to 1.00. The Youden Index for the EPDS cut-off scores ranges from 0.52 to 0.63. Analysis demonstrates that due to the variability of sensitivity and specificity for cut-off scores there is no score that provides a consistently high Youden Index.

Table 4. Cut-Off scores used for PPD Screening with EPDS

Cut-off score	Times Used	Sensitivity	Sens SD	Specificity	Spec SD	Youden Index	Youden SD	NND	NND SD
6	5	0.91	0.10	0.61	0.13	0.52	0.15	2.06	0.62
7	4	0.87	0.13	0.71	0.17	0.59	0.21	1.87	0.63
8	5	0.85	0.11	0.78	0.14	0.63	0.18	1.68	0.41
9	4	0.79	0.13	0.82	0.10	0.61	0.12	1.70	0.35
10	8	0.72	0.15	0.88	0.08	0.60	0.14	1.75	0.36
11	6	0.68	0.22	0.87	0.15	0.56	0.21	1.99	0.64
12	7	0.61	0.22	0.91	0.10	0.51	0.20	2.20	0.77
13	5	0.71	0.20	0.86	0.20	0.58	0.15	1.82	0.43
14	1	0.40		1.00		0.40		2.50	

An optimal NND value would be close to 1.0. For the EPDS cut-off scores the NND value range from 1.68 to 2.50. Consistent with Youden Index results the variability of sensitivity and specificity values results in no NND values that suggest an optimal cut-off score for the EPDS. Results in Table 5 confirm the lack of a consistent cut-off score across EPDS studies. Four selected studies with Youden Indices and NND values close to 1.0 have a range of cut-off scores from 8.5 to 12.

Table 5. Cut-Off scores used for PPD Screening with Selected EPDS Studies

Study	Cut-off Score	Sensitivity	Specificity	Youden Index	NND
Adewuya, 2005	8.5	0.94	0.97	0.91	1.099
Agoub, 2005	10	1.00	0.88	0.88	1.136
Agoub, 2005	11	0.96	0.95	0.91	1.099
Agoub, 2005	12	0.92	0.96	0.88	1.136

PPD Rate

The rate of PPD across the different studies ranged from 1% to 73% as shown in the Table 6**.**

Table 6. Post-Partum Depression rates for Cut-Scores used for PDSS Screening Instruments

Study, Country, Year	PPD Rate
Austin, 2005, Australia	5.2%
Milgrom, 2005, Australia	8.0%
Jardi, 2006, France	16.1%
Agoub, 2005, Morocco	6.9%
Adewuya, 2005, Nigeria	14.6%
Abiodun, 2006, Nigeria	18.6%
Navarro, 2007, Spain	25.4%
Teng, 2005, Taiwan	10.3%
Pitanupong, 2007, Thailand	1.0%
Vittayanont, 2006, Thailand	1.0%
Beck, 2005, USA	18.0%
Chaudron, 2010, USA	37.0%
Flynn, 2011, USA	73.0%
Gjerdingen, 2009, USA	8.9%
Hanusa, 2006, USA	11.0%
Yawn, 2009, USA	n/a

Discussion

PPD is the number one complication during the postpartum period **(**Coates, Schaefer, & Alexander, 2004). Although in the last 50 years there has been a big advance in the prevention of birth complications, the prevalence of PPD is still the same.

It is well known that half of the PPD cases are unrecognized (Georgiopoulos, Bryan, Wollan, & Yawn, 2001). The barriers for the screening and treatment of PPD were identified and it falls into two categories: 1) The patients' barriers: which includes lack of knowledge about signs and symptoms or about where they can seek help, the fear of medication if they are nursing the baby, and the fear of looking an imperfect mother if they have depression, 2) providers' barriers: Providers usually are primary care physicians, pediatricians and obstetric and gynecologists. Their barriers include also lack of knowledge about the best screening tools, signs, symptoms and treatment, in addition the restricted time and no compensation for the provided services (Rosenfield, 2007).

This study is aimed to decrease the undetectable number of PPD cases by finding the best practices for approaching PPD screening. It is an evidence-based study where a systematic review of published articles has been conducted.

Most commonly used instrument: Results showed that 46 studies out of 82 used an EPDS as the PPD screening tool. EPDS is the most commonly used instruments across all studies and it has been translated to different languages, these findings are consistent with the findings of Hewitt et al. (2010). EPDS is brief, simple and takes about 5 minutes to complete. It is easy to administer and score, which makes it a feasible instrument to be promoted into the maternal and child care programs of Public Health Centers (Abiodun, 2006). Studies have also showed that the EPDS performs better than the traditional PPD screening instruments as the Beck Depression Inventory when used in postnatal period (Prichard & Harris, 1996; Ballard, Davis, Cullen, Moran, & Dean, 1994). EPDS have a good acceptability and is considered as a comfortable screening tool as the result of Gemmil, Leigh, Ericksen, and Milgrom (2006). Gemmil and colleagues (2006) conducted a survey to find the acceptability of the EDPS postpartum screening tool, 479 out of 920 of the women responded to their survey; 97% of the women indicated that EPDS screening was desirable, 81.2% of women rated that the screening is comfortable to very comfortable and only 4.3% indicated that the screening is not comfortable.

Setting: Studies showed that 44 studies of PPD screening occurred in postnatal-prenatal clinics, 15 studies in maternity clinics, and 12 in community based organizations, which lead to the conclusion that postnatal-prenatal clinics are the best setting for performing PPD screening. These findings are in agreement with the Seehusen, Baldwin, Runkle, Clark, and Seehusen (2005) findings which showed that 70.2% of physicians always or often screened for PPD at postpartum gynecologic examinations, and 46% always or often screened mothers at well-child visits.

Studies were contracted worldwide, in Asia, Africa, Europe, America; Despite the geographic variation, overall the studies did not show s, a big change in PPD screening practices. The most commonly used instrument was EPDS, the administration period was around 6 weeks and the PPD rate had a very small variation among the different studies. It has been inferred that the geographic distribution is not affecting the PPD screening practices; however more studies have been conducted in the USA that focus on BDI, PHQ-9 and PPDS comparing to other countries where the focus was on EDPS.

Administration period: According to the DSM-4 definition, PPD is the major depression that begins in the first four week of delivery, but according to the CDI-10 definition, it is the major depression that begins within six weeks of delivery.

Most of the studies had been conducted 6 weeks postnatal and they gave a PPD prevalence rate similar to the PPD worldwide rate of 5%-20% (Miller, 2002). However, other studies were started as early as the first day of delivery (Flynn, 2005) or two weeks after delivery (Chardon, 2007) which could explain the high rate of PPD for those studies (73% and 37% respectively). It has been concluded from the study that the best time for applying the PPD screening instrument is around 6 weeks postnatal; earlier than six weeks more false cases can be detected as the new mother is trying to adapt to the new baby and also due to the tiredness and lack of sleep the mother experiences early in the confinement period. If the screening is later than six weeks it will be considered as a screening for major depression, not for PPD.

Cut-off points: Cut off score is very essential for the screening purpose. The purpose of this study was to find a recommended cut-off score for best PPD screening practices. At this cut-off scores there should be a balance between the sensitivity and specificity, so the test wouldn't lose its value either by having high false positive cases if the sensitivity is very high, or by having false negative cases if the specificity is very high. The screening tool that had been chosen is EDPS, the recommended cut-off score for EDPS is 10 (Cox et al., 1987). The results

showed inconsistency in the mean values of sensitivities and specificities as the corresponding cut- scores changes, and it could not find an optimal cut-off score to be recommended as the best value for screening. Our finding is consistent with other studies' findings showing variability in the optimal cut-off scores between population studies (Buist et al., 2002; Fergerson, Jamieson, & Lindsay, 2002; Nishimura & Ohashi, 2010).

Conclusion and Recommendations

The rate of PPD and its screening practices are similar worldwide. Screening for PPD using EPDS as a screening tool with the recommended cut-off point in each study population, and having an administration period around the six weeks postnatal at perinatal clinics could be considered as best practices for PPD.

There is a need for more future studies that can find the best practices for PPD within each country with respect to the PPD rate, the cost-effectiveness, the availability and distribution of perinatal clinics and the expertise in each center.

Limitations of the Study

This is a review study that compared different studies conducted worldwide, there are limitations to this study: 1. Variation in geographic location had been ignored also the cultural differences had not been accounted. 2. Small sample sizes of some reviewed studies. 3. Differences in the definition of postpartum depression between the articles.

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Appendix 1 – List of Included Studies

1. Abiodun, O. A. (2006). Postnatal depression in primary care populations in Nigeria. *General Hospital Psychiatry*, *28*, 133-136.
2. Adewuya, A. O., Eegunranti, A. B., & Lawal, A. (2005). Prevalence of postnatal depression in Western Nigerian women: a controlled study. *International Journal of Psychiatry in Clinical Practice*, *9*(1), 60-64.
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9. Hanusa, B. H. Scholle,S. H., Haskett, R. F., Spadaro, K., & Wisner, K. L. (2006). Screening for Depression in the Postpartum Period: A Comparison of Three Instruments. *Journal of Women's Health, 17*(4), 585-596.
10. Jardri, R., Pelta, J., Maron, M., Delion, P., Codaccioni, X., & Goudemand, M. (2006). Predictive validation study of the Edinburgh Postnatal Depression Scale in the first week after delivery and risk analysis for postnatal depression. *Journal of Affective Disorders*, *93*, 1-3.
11. Milgrom, J., Ericksen, J., Negri, L., & Gemmill, A. W. (2005). Screening for postnatal depression in routine primary care: properties of the Edinburgh Postnatal Depression Scale in an Australian sample. *Australia and New Zealand Journal of Psychiatry*, *39*, 833-839.
12. Navarro, P., Ascaso, C., Garcia-Esteve, L., Aguado, J., Torres, A., & Martin-Santos, R. (2007). Postnatal psychiatric morbidity: a validation study of the GHQ-12 and the EPDS as screening tools. *General Hospital Psychiatry*, *29*, 1-7.
13. Pitanupong, J., Liabsuetrakul, T., & Vittayanont, A. (2007). Validation of the Thai Edinburgh Postnatal Depression Scale for screening postpartum depression. *Psychiatry Research, 149*, 253-259.
14. Teng, H. W., Hsu, C. S., Shih, S. M., Lu, M. L., Pan, J. J., & Shen, W. W. (2005). Screening postpartum depression with the Taiwanese version of the Edinburgh Postnatal Depression Scale. *Comprehensive Psychiatry, 46*, 261–265.
15. Vittayanont, A., Liabsuetrakul, T., & Pitanupong, J. (2006). Development of Postpartum Depression Screening Scale (PDSS): a Thai version for screening postpartum depression. *Journal of the Medical Association of Thailand*, *89*, 1–7.
16. Yawn, P., Pace, W., Wollan, P. C., Bertram, S., Kurland, M., & Dietrich, A. (2009). Concordance of Edinburgh Postnatal Depression Scale (EPDS) and Patient Health Questionnaire (PHQ-9) to Assess Increased Risk of Depression among Postpartum Women. *Journal of the American Board of Family Medicine*, *22*(5), 483-491

Appendix 2 – Edinburgh Postnatal Depression Scale (EPDS)

Edinburgh Postnatal Depression Scale[1] (EPDS)

Name: _____ Address: _____

Your Date of Birth: _____ _____

Baby's Date of Birth: _____ Phone: _____

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt **IN THE PAST 7 DAYS**, not just how you feel today.

Here is an example, already completed.

I have felt happy:
- ☐ Yes, all the time
- ☒ Yes, most of the time — This would mean: "I have felt happy most of the time" during the past week.
- ☐ No, not very often — Please complete the other questions in the same way.
- ☐ No, not at all

In the past 7 days:

1. I have been able to laugh and see the funny side of things
   - ☐ As much as I always could
   - ☐ Not quite so much now
   - ☐ Definitely not so much now
   - ☐ Not at all

2. I have looked forward with enjoyment to things
   - ☐ As much as I ever did
   - ☐ Rather less than I used to
   - ☐ Definitely less than I used to
   - ☐ Hardly at all

*3. I have blamed myself unnecessarily when things went wrong
   - ☐ Yes, most of the time
   - ☐ Yes, some of the time
   - ☐ Not very often
   - ☐ No, never

4. I have been anxious or worried for no good reason
   - ☐ No, not at all
   - ☐ Hardly ever
   - ☐ Yes, sometimes
   - ☐ Yes, very often

*5 I have felt scared or panicky for no very good reason
   - ☐ Yes, quite a lot
   - ☐ Yes, sometimes
   - ☐ No, not much
   - ☐ No, not at all

*6. Things have been getting on top of me
   - ☐ Yes, most of the time I haven't been able to cope at all
   - ☐ Yes, sometimes I haven't been coping as well as usual
   - ☐ No, most of the time I have coped quite well
   - ☐ No, I have been coping as well as ever

*7 I have been so unhappy that I have had difficulty sleeping
   - ☐ Yes, most of the time
   - ☐ Yes, sometimes
   - ☐ Not very often
   - ☐ No, not at all

*8 I have felt sad or miserable
   - ☐ Yes, most of the time
   - ☐ Yes, quite often
   - ☐ Not very often
   - ☐ No, not at all

*9 I have been so unhappy that I have been crying
   - ☐ Yes, most of the time
   - ☐ Yes, quite often
   - ☐ Only occasionally
   - ☐ No, never

*10 The thought of harming myself has occurred to me
   - ☐ Yes, quite often
   - ☐ Sometimes
   - ☐ Hardly ever
   - ☐ Never

Administered/Reviewed by _____ Date _____

[1]Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786 .

[2]Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression N Engl J Med vol. 347, No 3, July 18, 2002, 194-199

Edinburgh Postnatal Depression Scale[1] (EPDS)

Postpartum depression is the most common complication of childbearing.[2] The 10-question Edinburgh Postnatal Depression Scale (EPDS) is a valuable and efficient way of identifying patients at risk for "perinatal" depression. The EPDS is easy to administer and has proven to be an effective screening tool.

Mothers who score above 13 are likely to be suffering from a depressive illness of varying severity. The EPDS score should not override clinical judgment. A careful clinical assessment should be carried out to confirm the diagnosis. The scale indicates how the mother has felt ***during the previous week***. In doubtful cases it may be useful to repeat the tool after 2 weeks. The scale will not detect mothers with anxiety neuroses, phobias or personality disorders.

Women with postpartum depression need not feel alone. They may find useful information on the web sites of the National Women's Health Information Center <www.4women.gov> and from groups such as Postpartum Support International <www.chss.iup.edu/postpartum> and Depression after Delivery <www.depressionafterdelivery.com>.

SCORING

QUESTIONS 1, 2, & 4 (without an *)
Are scored 0, 1, 2 or 3 with top box scored as 0 and the bottom box scored as 3.

QUESTIONS 3, 5-10 (marked with an *)
Are reverse scored, with the top box scored as a 3 and the bottom box scored as 0.

Maximum score: 30
Possible Depression: 10 or greater
Always look at item 10 (suicidal thoughts)

Instructions for using the Edinburgh Postnatal Depression Scale:

1. The mother is asked to check the response that comes closest to how she has been feeling in the previous 7 days.
2. All the items must be completed.
3. Care should be taken to avoid the possibility of the mother discussing her answers with others. (Answers come from the mother or pregnant woman.)
4. The mother should complete the scale herself, unless she has limited English or has difficulty with reading.

[1]Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786.

[2]Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression N Engl J Med vol. 347, No 3, July 18, 2002, 194-199

Appendix 3 – PHQ-9 for Adults (Public Health Questionnaire)

PHQ-9 for ADULTS
Patient Health Questionnaire

Name: _____ Date: _____

Over the **last 2 weeks**, how often have you been bothered by any of the following problems? (Please **CIRCLE** to indicate your answer)	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3

Note: Clinic Staff - Please file electronically in the EpicCare PHQ9 Document Flow sheet.

DA-2701

Rev. Date 2009246

PHQ-9 for ADOLESCENTS
Modified Patient Health Questionnaire

Name: _____ Date: _____

Over the **last 2 weeks**, how often have you been bothered by any of the following problems? (Please **CIRCLE** to indicate your answer)	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, irritable, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite, weight loss, or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as school work, reading or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3

Note: Clinic Staff - Please file electronically in the EpicCare PHQ9A Document Flow sheet.

DA-2701

Rev. Date 2009246

Appendix 4 – List of Public Health Competencies Met

Specific Competencies
Domain #1: Analytic Assessment Skill
Defines a problems
Determines appropriate uses and limitations of both quantitative and qualitative data
Selects and defines variables relevant to defined public health problems
Identifies relevant and appropriate data and information sources
Evaluates the integrity and comparability of data and identifies gaps in data sources
Makes relevant inferences from quantitative and qualitative data
Obtains and interprets information regarding risks and benefits to the community
Applies data collection processes, information technology applications, and computer systems storage/retrieval strategies
Recognizes how the data illuminates ethical, political, scientific, economic, and overall public health issues
Domain #2: Policy Development/Program Planning Skills
Collects, summarizes, and interprets information relevant to an issue
Domain #3: Communication Skills
Communicates effectively both in writing and orally, or in other ways
Effectively presents accurate demographic, statistical, programmatic, and scientific information for professional and lay audiences
Attitudes
Listens to others in an unbiased manner, respects points of view of others, and promotes the expression of diverse opinions and perspectives
Domain #4: Cultural Competency Skills
Identifies the role of cultural, social, and behavioral factors in determining the delivery of public health services
Attitudes
Understands the dynamic forces contributing to cultural diversity
Domain #5: Community Dimensions of Practice Skills
Develops, implements, and evaluates a community public health assessment
Domain #6: Basic Public Health Sciences Skills
Defines, assesses, and understands the health status of populations, determinants of health and illness, factors contributing to health promotion and disease prevention, and factors influencing the use of health services
Understands the historical development, structure, and interaction of public health and health care systems
Identifies and applies basic research methods used in public health
Applies the basic public health sciences including behavioral and social sciences, biostatistics, epidemiology, environmental public health, and prevention of chronic and infectious diseases and injuries
Identifies and retrieves current relevant scientific evidence
Identifies the limitations of research and the importance of observations and interrelationships
Attitudes
Develops a lifelong commitment to rigorous critical thinking

Domain #8: Leadership and Systems Thinking Skills
Helps create key values and shared vision and uses these principles to guide action
Identifies internal and external issues that may impact delivery of essential public health services (i.e. strategic planning)
Contributes to development, implementation, and monitoring of organizational performance standards